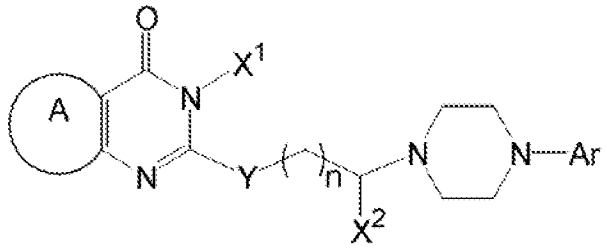
AMENDMENTS TO THE CLAIMS

1. (**Previously Presented**) Pyrimidine derivatives represented by the following formula (I)



(I)

in which

ring A stands for a carbocyclic group or heterocyclic group,

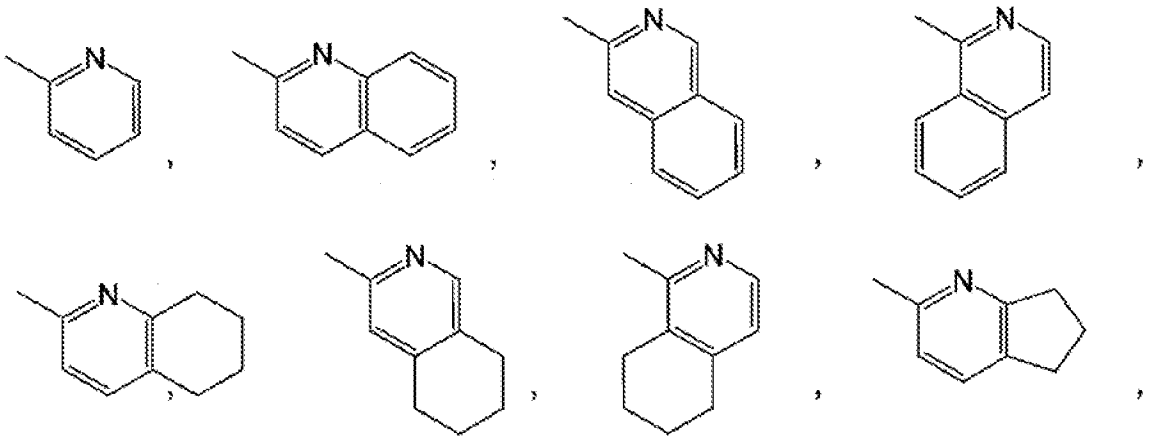
X^1 stands for amino, lower alkylamino, di-lower alkylamino, lower alkylideneamino, lower alkyl, phenyl lower alkyl or substituted or unsubstituted phenyl,

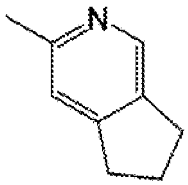
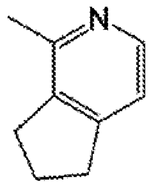
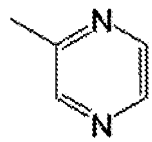
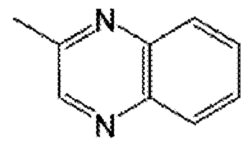
X^2 stands for hydrogen or lower alkyl,

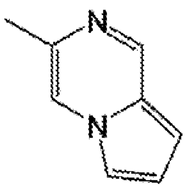
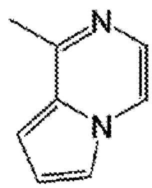
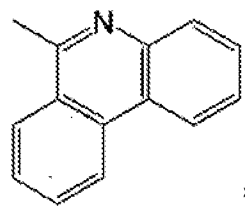
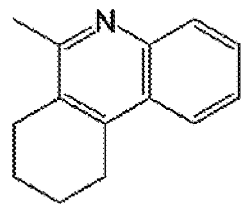
Y stands for a direct bond, sulfur or nitrogen,

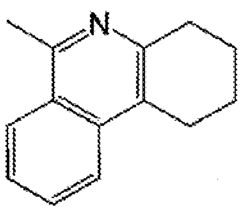
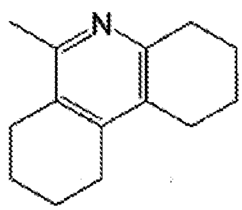
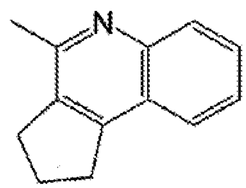
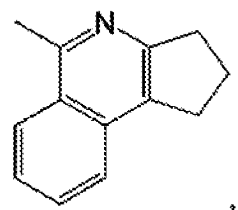
n is 0 or an integer of 1 – 4,

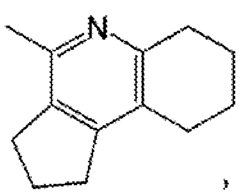
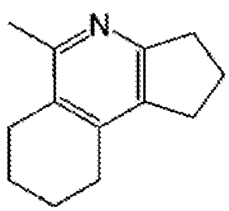
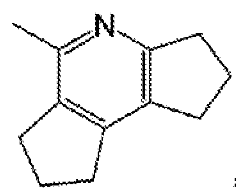
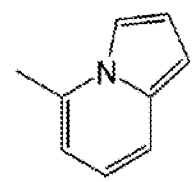
Ar stands for a group represented by any of the following formulae,

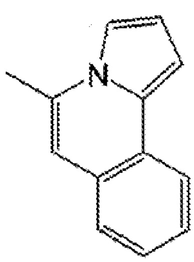
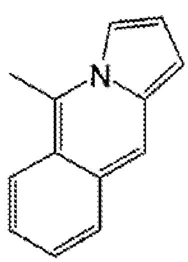
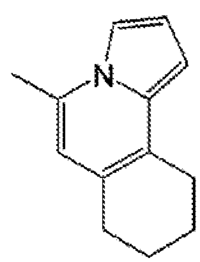
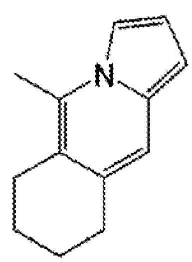


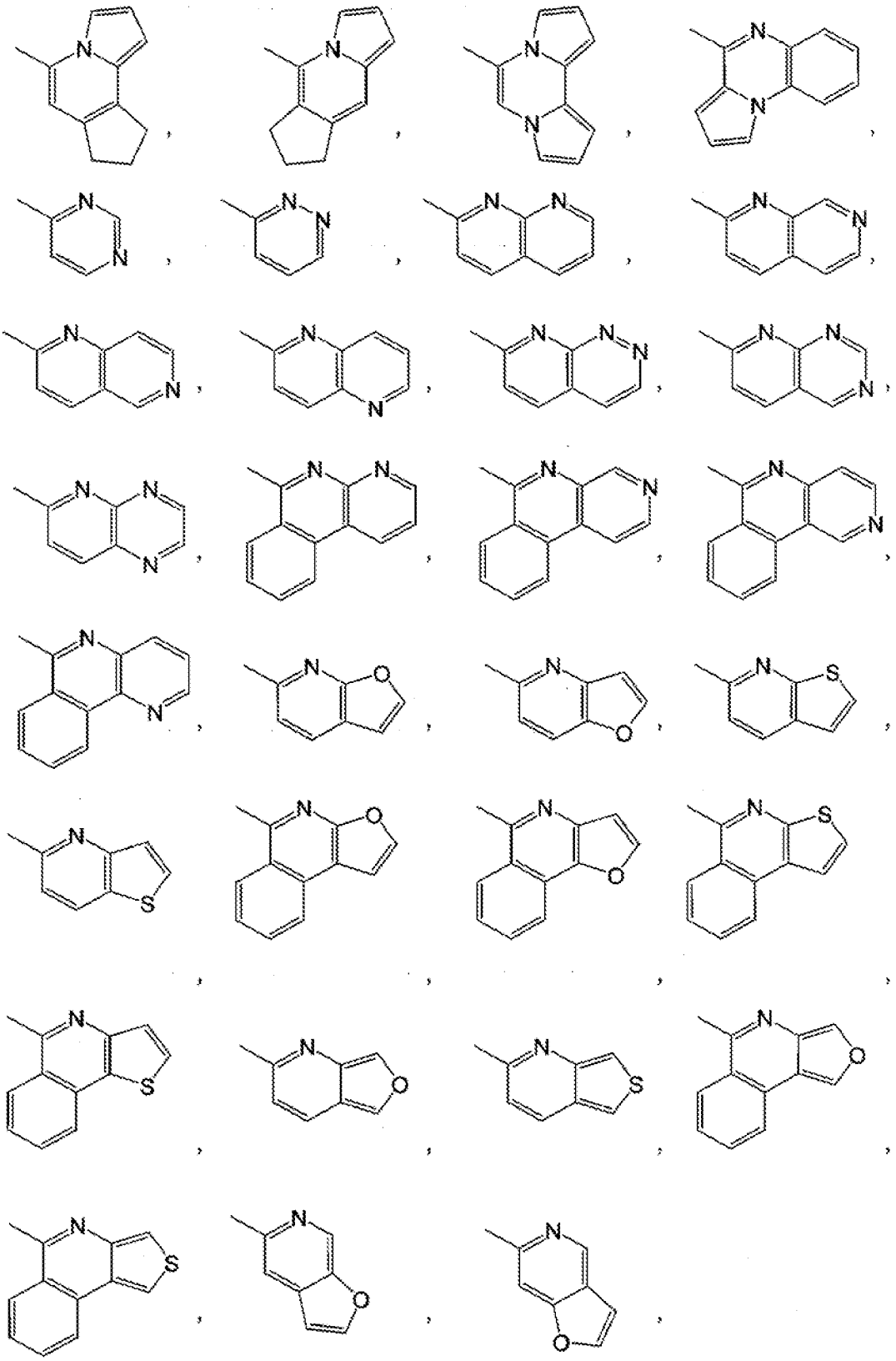
 ,  ,  ,  ,

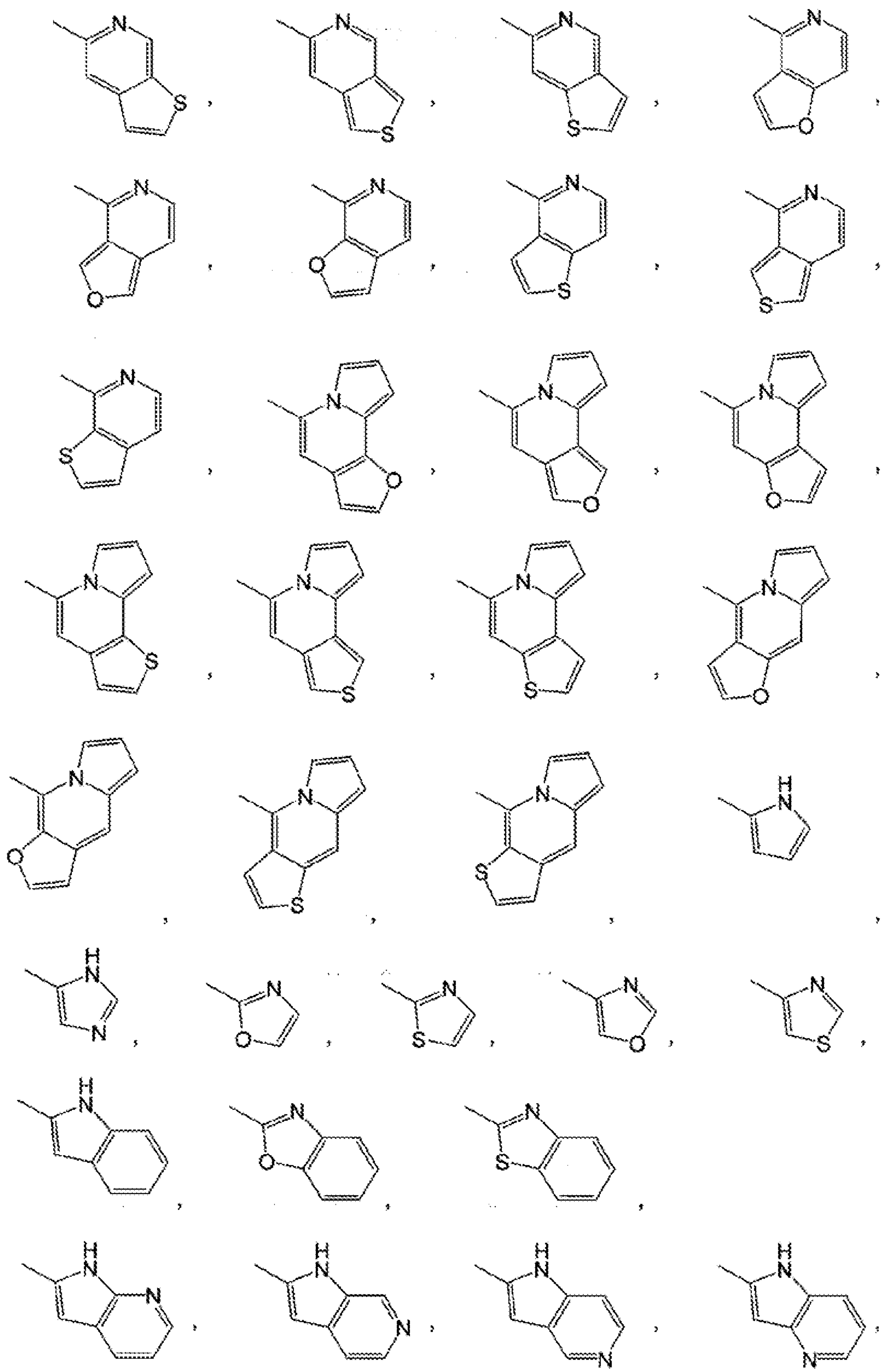
 ,  ,  ,  ,

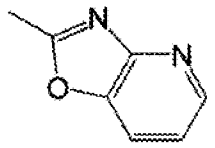
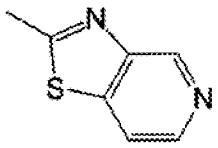
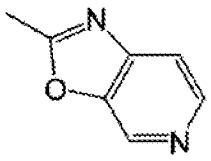
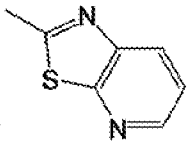
 ,  ,  ,  ,

 ,  ,  ,  ,

 ,  ,  ,  ,

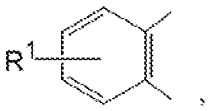
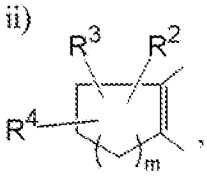
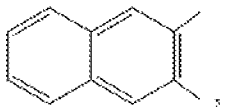
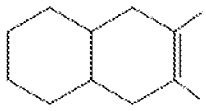




 ,  ,  , or  ,

which are, independently from each other, either unsubstituted or substituted with substituent(s) selected from halogen, lower alkyl, hydroxyl, lower alkoxy and phenyl,
or their pharmaceutically acceptable salts.

2. (**Original**) The pyrimidine derivatives or their pharmaceutically acceptable salts as set forth in Claim 1, in which the ring A stands for a carbocyclic group represented by any of the following formulae i) – iv):

i)  , ii)  , iii)  , iv) 

in which

R^1 stands for hydrogen, halogen, lower alkyl, halogenated lower alkyl, lower alkoxy, carboxyl, lower alkoxycarbonyl, phenyl, amino, hydrazino or nitro,

R^2, R^3 and R^4 either stand for, independently from each other, hydrogen, halogen, lower alkyl, lower alkoxy, phenyl or hydroxyl; or two out of R^2, R^3 and R^4 together stand for oxo or lower alkylenedioxy, and

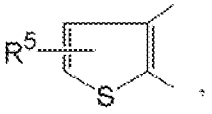
m is an integer of 1 – 3.

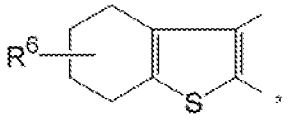
3. (**Original**) The pyrimidine derivatives or their pharmaceutically acceptable salts as set forth in Claim 2, in which the ring A stands for a carbocyclic group represented by the formula ii).

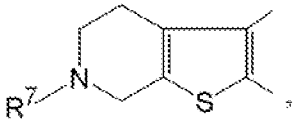
4. (**Original**) The pyrimidine derivatives or their pharmaceutically acceptable salts as set forth in Claim 3, in which m is 2.

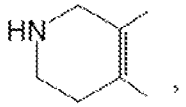
5. (**Original**) The pyrimidine derivatives or their pharmaceutically acceptable salts as set forth in Claim 4, in which all of R^2, R^3 and R^4 stand for hydrogen atoms.

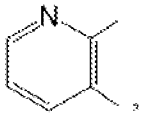
6. (**Original**) The pyrimidine derivatives or their pharmaceutically acceptable salts as set forth in Claim 1, in which the ring A stands for a heterocyclic group represented by any of the following formulae v) – xv):

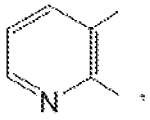
v) 

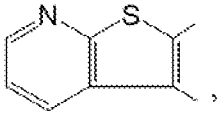
vi) 

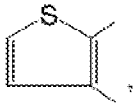
vii) 

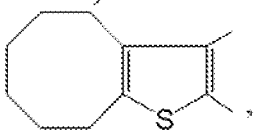
viii) 

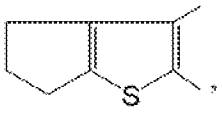
ix) 

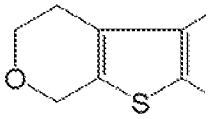
x) 

xi) 

xii) 

xiii) 

xiv)  , and

xv) 

in which

R^5 stands for hydrogen, lower alkyl, carboxyl or lower alkoxycarbonyl,

R^6 stands for hydrogen or lower alkyl,

and

R^7 stands for hydrogen, lower alkyl, lower alkanoyl, lower alkoxycarbonyl or phenyl lower alkoxycarbonyl.

7. **(Cancelled)**

8. **(Previously Presented)** The pyrimidine derivatives or their pharmaceutically acceptable salts as set forth in Claim 1, in which X^1 stands for amino or lower alkyl.

9. **(Previously Presented)** The pyrimidine derivatives or their pharmaceutically acceptable salts as set forth in Claim 1, in which X^2 stands for hydrogen.

10. **(Previously Presented)** The pyrimidine derivatives or their pharmaceutically acceptable salts as set forth in Claim 1, in which Y stands for a direct bond or sulfur.

11. **(Previously Presented)** The pyrimidine derivatives or their pharmaceutically acceptable salts as set forth in Claim 1, in which n stands for 2 or 3.

12. **(Previously Presented)** The pyrimidine derivatives or their pharmaceutically acceptable salts as set forth in Claim 1, in which Ar stands for quinolyl group which is either unsubstituted or substituted with substituent(s) selected from halogen, lower alkyl, hydroxyl, lower alkoxy and phenyl.

13. **(Previously Presented)** A pyrimidine derivative selected from the group consisting of the following compounds or pharmaceutically acceptable salt thereof:
3-amino-5,6-dimethyl-2-[3-(4-quinolin-2-ylpiperazin-1-yl)propylthio]-3H-thieno[2,3-d]pyrimidin-4-one,
3-amino-2-[3-(4-quinolin-2-ylpiperazin-1-yl)propylthio]-5,6,7,8- tetrahydro-3H-benzo[4,5]thieno[2,3-d]pyrimidin-4-one,
3-amino-5,6-dimethyl-2-[3-(4-pyrrolo[1,2-a]quinoxalin-4- ylpiperazin-1-yl)propylthio]-3H-thieno[2,3-d]pyrimidin-4-one,

3-amino-5-methyl-4-oxo-2-[3-(4-quinolin-2-ylpiperazin-1-yl)propylthio]- 3,4-dihydrothieno[2,3-d]pyrimidine-6-carboxylic acid ethyl ester,

3-amino-2-[3-(4-quinolin-2-ylpiperazin-1-yl)propylthio]-5,6,7,8,9,10- hexahydro-3H-11-thia-1,3-diazacycloocta[a]inden-4-one,

3-amino-7-methyl-2-[3-(4-quinolin-2-ylpiperazin-1-yl)propylthio]- 5,6,7,8-tetrahydro-3H-benzo[4,5]thieno[2,3-d]pyrimidin-4-one,

3-amino-2-[3-[4-(4-methylquinolin-2-yl)piperazin-1-yl]propylthio]- 5,6,7,8-tetrahydro-3H-benzo[4,5]thieno[2,3-d]pyrimidin-4-one,

3-amino-2-[3-(4-quinolin-2-ylpiperazin-1-yl)propylthio]-5,6,7,8- tetrahydro-3H-9-thia-1,3,7-triazafluoren-4-one,

3-amino-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-5,6,7,8-tetrahydro- 3H-quinazolin-4-one,

3-amino-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H-quinazolin-4- one,

3-amino-2-[4-[4-(4-methylquinolin-2-yl)piperazin-1-yl]butyl]-3H- quinazolin-4-one,

3-amino-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H- thieno[3,2-d]pyrimidin-4-one,

3-amino-6-methyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H- quinazolin-4-one,

3-amino-2-[4-[4-(5-methoxyquinolin-2-yl)piperazin-1-yl]butyl]-3H- quinazolin-4-one,

3-amino-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H- thieno[2,3-d]pyrimidin-4-one,

3-amino-5-chloro-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H- quinazolin-4-one,

3-amino-5-hydrazino-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H- quinazolin-4-one,

3-amino-5,6-dimethyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H- thieno[2,3-d]pyrimidin-4-one,

3-amino-8-methyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-5,6,7,8- tetrahydro-3H-quinazolin-4-one,

3-amino-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3,5,6,7,8,9- hexahydro-cyclohepta[d]pyrimidin-4-one,

3-amino-6-fluoro-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H- quinazolin-4-one,

3-amino-6-methyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-5,6,7,8- tetrahydro-3H-quinazolin-4-one,

3-amino-6-ethyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-5,6,7,8- tetrahydro-3H-quinazolin-4-one,

3-amino-6-hydroxy-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-5,6,7,8- tetrahydro-3H-quinazolin-4-one,

3-amino-2-[3-(4-quinolin-2-ylpiperazin-1-yl)propylamine]-5,6,7,8- tetrahydro-3H-quinazolin-4-one,

3-methyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-5,6,7,8-tetrahydro- 3H-quinazolin-4-one,

3-ethyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-5,6,7,8-tetrahydro- 3H-quinazolin-4-one,

3-methyl-2-[4-[4-(4-methylquinolin-2-yl)piperazin-1-yl]butyl]-5,6,7,8- tetrahydro-3H-quinazolin-4-one,

3-ethyl-2-[4-[4-(4-methylquinolin-2-yl)piperazin-1-yl]butyl]-5,6,7,8- tetrahydro-3H-quinazolin-4-one,

3-benzyl-2-[4-[4-(4-methylquinolin-2-yl)piperazin-1-yl]butyl]-5,6,7,8- tetrahydro-3H-quinazolin-4-one,

3-methyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H-quinazolin-4- one,

3-ethyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H-quinazolin-4- one,

6-chloro-3-methyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H- quinazolin-4-one,

3-methyl-2-[3-(4-quinolin-2-ylpiperazin-1-yl)propylthio]-5,6,7,8- tetrahydro-3H-quinazolin-4-one, and

3-methyl-2-[3-(4-quinolin-2-ylpiperazin-1-yl)propylthio]-3H- quinazolin-4-one.

14. (**Previously Presented**) Serotonin receptor subtype 3 (5-HT_3) antagonistic agents concurrently having serotonin receptor subtype 1A (5-HT_{1A}) agonistic activity, said agents containing the pyrimidine derivatives or their pharmaceutically acceptable salts as set forth in Claim 1.

15. (**Previously Presented**) Medical compositions containing the pyrimidine derivatives or their pharmaceutically acceptable salts as set forth in Claim 1 and pharmaceutically acceptable carriers.

16. **(Previously Presented)** Treating agents for irritable bowel syndrome (IBS) containing the pyrimidine derivatives or their pharmaceutically acceptable salts as set forth in claim 1.

17. **(Cancelled)**

18. **(Currently Amended)** ~~The method as set forth in Claim 17, in which the 5-HT_3 antagonistic agent concurrently having 5-HT_{1A} agonistic activity is a pyrimidine derivative or a pharmaceutically acceptable salt thereof as set forth in Claim 1.~~

A method for treating irritable bowel syndrome (IBS) by exerting 5-HT_{1A} agonistic activity and 5-HT_3 antagonistic activity *in vivo* simultaneously and cooperatively, which comprises

administering to a human being or other mammals who requires irritable bowel syndrome (IBS) therapy, a 5-HT_3 antagonistic agent which concurrently exhibits 5-HT_{1A} agonistic activity,

in which the 5-HT_3 antagonistic agent which concurrently exhibits 5-HT_{1A} agonistic activity is a pyrimidine derivative selected from the group consisting of the following compounds, or their pharmaceutically acceptable salt:

3-amino-5,6-dimethyl-2-[3-(4-quinolin-2-ylpiperazin-l-yl)propylthio]-3H-thieno[2,3-d]pyrimidin-4-one,

3-amino-2-[3-(4-quinolin-2-ylpiperazin-l-yl)propylthio]-5,6,7,8-tetrahydro-3H-benzo[4,5]thieno[2,3-d]pyrimidin-4-one,

3-amino-5,6-dimethyl-2-[3-(4-pyrrolo[1,2-a]quinoxalin-4-ylpiperazin-1-yl)propylthio]-3H-thieno[2,3-d]pyrimidin-4-one,

3-amino-5-methyl-4-oxo-2-[3-(4-quinolin-2-ylpiperazin-l-yl)propylthio]3,4-dihydrothieno[2,3-d]pyrimidine-6-carboxylic acid ethyl ester,

3-amino-2-[3-(4-quinolin-2-ylpiperazin-l-yl)propylthio]-5,6,7,8,9,10- hexahydro-3H-11-thia-1,3-diazacycloocta[a]inden-4-one,

3-amino-7-methyl-2- [3-(4-quinolin-2-ylpiperazin-l-yl)propylthio]- 5,6,7,8-tetrahydro-3H-benzo[4,5]thieno[2,3-d]pyrimidin-4-one,

3-amino-2-[3-[4-(4-methylquinolin-2-yl)piperazin-l-yl]propylthio]-5,6,7,8-

tetrahydro-3H-benzo[4,5]thieno[2,3-d]pyrimidin-4-one,

3-amino-2-[3-(4-quinolin-2-ylpiperazin-l-yl)propylthio]-5,6,7,8- tetrahydro-3H-9-thia-1,3, 7-triazafluoren-4-one,

3-amino-2-[4-(4-quinolin-2-ylpiperazin -l-yl)butyl]-5,6,7,8-tetrahydro-3H-quinazolin-4-one,

3-amino-2-[4-(4-quinolin-2-ylpiperazin-l-yl)butyl]-3H-quinazolin-4-one,

3-amino-2-[4-[4-(4-methylquinolin-2-yl)piperazin-1-yl]butyl]-3H-quinazolin-4-one,

3-amino-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H-thieno[3,2-d]pyrimidin-4-one,

3-amino-6-methyl-2-[4-(4-quinolin-2-ylpiperazin-l-yl)butyl]-3H-quinazolin-4-one,

3-amino-2-[4-[4-(5-methoxyquinolin-2-yl)piperazin-l-yl]butyl]-3H-quinazolin-4-one,

3-amino-2-[4-(4-quinolin -2-ylpiperazin-l-yl)butyl]-3Hthieno[2,3-d]pyrimidin-4-one,

3-amino-5-chloro-2-[4-(4-quinolin-2-ylpiperazin-l-yl)butyl]-3H-quinazolin-4-one,

3-amino-5-hydrazino-2-[4-(4-quinolin-2-ylpiperazin -1-yl)butyl]-3Hquinazolin-4-one,

3-amino-5,6-dimethyl-2-[4-(4-quinolin-2-ylpiperazin -l-yl)butyl]-3H-thieno[2,3-d]pyrimidin-4-one,

3-amino-8-methyl-2-[4-(4-quinolin-2-ylpiperazin-l-yl)butyl]-5,6,7,8-tetrahydro-3H-quinazolin-4-one,

3-amino-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3,5,6,7,8,9- hexahydro-cyclohepta[d]pyrimidin-4-one,

3-amino-6-fluoro-2-[4-(4-quinolin-2-ylpiperazin-l-yl)butyl]-3H-quinazolin-4-one,

3-amino-6-methyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-5,6,7,8-tetrahydro-3H-quinazolin-4-one,

3-amino-6-ethyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-5,6,7,8-tetrahydro-3H-quinazolin-4-one,

3-amino-6-hydroxy-2-]4-(4-quinolin-2-ylpiperazin-l-yl)butyl]-5,6,7,8- tetrahydro-3H-

quinazolin-4-one,

3-amino-2-[3-(4-quinolin-2-ylpiperazin-l-yl)propylamine]-5,6,7,8-tetrahydro-3H-quinazolin-4-one,

3-methyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-5,6,7,8-tetrahydro-3H -quinazolin-4-one,

3-ethyl-2-[4-(4--quinolin-2-ylpiperazin-1-yl)butyl]-5,6,7,8-tetrahydro-3H -quinazolin-4-one,

3-methyl-2-[4-[4-(4-methylquinolin-2-yl)piperazin-1-yl]butyl]-5,6,7,8-tetrahydro-3H -quinazolin-4-one,

3-ethyl-2-[4-[4-(4-methylquinolin-2-yl)piperazin-1-yl]butyl]-5,6,7,8-tetrahydro-3H -quinazolin-4-one,

3-benzyl-2-[4-[4-(4-methylquinolin-2-yl)piperazin-1-yl]butyl]-5,6,7,8-tetrahydro-3H -quinazolin-4-one,

3-methyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H-quinazolin-4-one,

3-ethyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H-quinazolin-4-one,

6-chloro,-3-methyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H-quinazolin-4-one,

3-methyl-2-[3-(4-quinolin-2-ylpiperazin-1yl)propylthio]-5,6,7,8-tetrahydro-3H-quinazolin-4-one,

3-methyl-2-[3-(4-quinolin-2-ylpiperazin-1yl)propylthio]-3H-quinazolin-4-one,

3-propyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-5,6,7,8-tetrahydro-3H -quinazolin-4-one,

3-benzyl-2-[4-(4-quinolin -2-ylpiperazin-1-yl)butyl]-5,6,7,8-tetrahydro-3H -quinazolin-4-one,

3-methyl-2-[3-(4-quinolin -2-ylpiperazin-1-yl)propyl]-5,6,7,8-tetrahydro-3H -quinazolin-4-one,

2-[4-(4-benzothiazol-2-ylpiperazin-1-yl)butyl]-3-methyl-5,6,7,8-tetrahydro-3H-quinazolin-4-one,

2-[4-(4-benzothiazol-2-ylpiperazin-1-yl)butyl]-3-ethyl-5,6,7,8-tetrahydro-3H -quinazolin-4-one,

2-[4-(4-benzothiazol-2-ylpiperazin-1-yl)butyl]-3-benzyl-5,6,7,8-tetrahydro-3H -quinazolin-4-one,

3,6-dimethyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-5,6,7,8-tetrahydro-3H-quinazolin-4-one,

3-ethyl-6-methyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-5,6,7,8-tetrahydro-3H-quinazolin-4-one,

3-methyl-2-[4-)4-quinolin-2-ylpiperazin-1-yl)pentyl]-5,6,7,8-tetrahydro-3H-quinazolin-4-one,

3-isopropyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H-quinazolin-4-one,

3-benzyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H-quinazolin-4-one,

3-(4-methoxyphenyl)-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H-quinazolin-4-one,

5-chloro-3-methyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H-quinazolin-4-one,

1,5-dimethyl-6-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-1,5-dihydropyrazolo[3,4-d]pyrimidin-4-one,

6,7-dimethoxy-3-methyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H-quinazolin-4-one,

3,5,6-trimethyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H-thieno[2,3-d]pyrimidin-4-one,

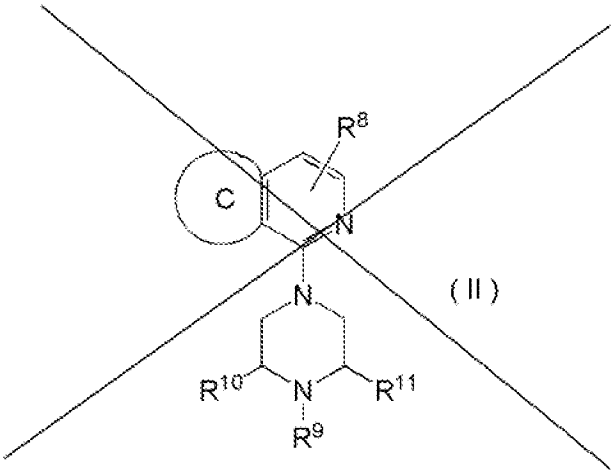
3,7-dimethyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H-quinazolin-4-one,

6-bromo-3-methyl-2-[4-(4-quinolin-2-ylpiperazin-1-yl)butyl]-3H-quinazolin-4-one,

3-methyl-2-[3-(4-quinolin-2-ylpiperazin-1-yl)propylamino]-5,6,7,8-tetrahydro-3H-quinazolin-4-one, and

3-methyl-2-[3-(4-quinolin-2-ylpiperazin-1-yl)propylamine]-3H-quinazolin-4-one.

19. (**Currently Amended**) ~~The method as set forth in Claim 17, in which the 5-HT$_3$ antagonistic agents concurrently having 5-HT$_{1A}$ agonistic activity are piperazinylpyridine derivatives represented by the following formula (II),~~



in which

ring C stands for unsubstituted benzene ring or an unsubstituted heterocyclic group selected from pyridine, furan and thiophene; benzene ring substituted with substituent(s) selected from halogen, lower alkyl, phenyl, hydroxyl, lower alkoxy, phenyl lower alkoxy (the phenyl moiety being either unsubstituted or halogen-substituted), amino, lower alkylamino, di-lower alkylamino, lower alkylthio, lower alkylsulfinyl and aminosulfonyloxy; or heterocyclic group selected from halogen- or lower alkyl-substituted pyridine, furan and thiophene,

R^8 stands for hydrogen, halogen or lower alkyl,

R^9 stands for hydrogen, lower alkyl, phenyl lower alkyl (the phenyl moiety being unsubstituted or substituted with substituent(s) selected from halogen, lower alkyl and lower alkoxy), amino lower alkyl (the amino moiety being either unsubstituted or mono- or di-substituted with lower alkyl, or optionally forming a cyclic imido group) or phenyl cycloalkyl (the phenyl moiety being either unsubstituted or substituted with substituent(s) selected from halogen, lower alkyl and lower alkoxy),

R^{10} stands for hydrogen or lower alkyl, or

R^9 and R^{10} may together form the residual members of pyrrolidine ring or piperidine ring (which may be unsubstituted or substituted with substituent(s) selected from hydroxyl, lower alkoxy and phenyl lower alkoxy), and

R^{11} stands for hydrogen or lower alkyl,

or their pharmaceutically acceptable salts.

A method for treating irritable bowel syndrome (IBS) by exerting 5-HT_{1A} agonistic activity and 5-HT_3 antagonistic activity *in vivo* simultaneously and cooperatively, which comprises

administering to a human being or other mammals who requires irritable bowel syndrome (IBS) therapy, a 5-HT_3 antagonistic agent which concurrently exhibits 5-HT_{1A} agonistic activity,

in which the 5-HT_3 antagonistic agent which concurrently exhibits 5-HT_{1A} is a piperazinylpyridine derivative selected from the group consisting of the following compounds, or their pharmaceutically acceptable salt:

7-chloro-1-(4-methylpiperazin-1-yl)isoquinoline,

7-((8aS)-octahydropyrrolo[1,2-a]pyrazin-2-yl)thieno[2,3-c]- pyridine,

7-((8aS)-octahydropyrrolo[1,2-a]pyrazin-2-yl)furo[2,3-c]- pyridine,

2-methyl-4-((8aS)-octahydropyrrolo[1,2-a]pyrazin-2-yl)- thieno[3,2-c]pyridine,

7-methoxy-1-((8aR)-octahydropyrrolo[1,2-a]pyrazin-2-yl)- isoquinoline,

2-bromo-4-(4-methylpiperazin-1-yl)thieno[3,2-c]pyridine,

7-piperazin-1-ylfuro[2,3-c]pyridine,

4-(4-methylpiperazin-1-yl)furo[2,3-c]pyridine,

7-(4-methylpiperazin-1-yl)thieno[2,3-c]pyridine,

4-(4-methylpiperazin-1-yl)thieno[3,2-c]pyridine,

3-chloro-1-(4-methylpiperazin-1-yl)isoquinoline dihydrochloride,

7-(4-ethylpiperazin-1-yl)-thieno[2,3-c]pyridine,

8-(4-methylpiperazin-1-yl)[1,7]naphthyridine,

2-methylpiperazin-1-ylfuro[3,2-c]pyridine,

7-methoxy-4-methyl-1-piperazin-1-ylisoquinoline,

7-bromo-1-piperazin-1-ylisoquinoline,

7-methoxy-1-(4-methylpiperazin-1-yl)isoquinoline,

7-methoxy-1-piperazin-1-ylisoquinoline,

1-piperazin-1-ylisoquinoline,

7-methoxy-1-(3-methylpiperazin-1-yl)isoquinoline,

6-methoxy-1-piperazin-1-ylisoquinoline,

7-methyl-1-piperazin-1-ylisoquinoline,

7-methyl-1-(4-methylpiperazin-1-yl)isoquinoline,

7-chloro-1-piperazin-1-ylisoquinoline,

7-fluoro-1-(4-methylpiperazin-1-yl)isoquinoline,

6-chloro-1-piperazin-1-ylisoquinoline,

5-chloro-1-(4-methylpiperazin-1-yl)isoquinoline,

7-fluoro-1-piperazin 1-ylisoquinoline,

1-(4-benzo[1,3]dioxol-5-ylmethylpiperazin-1-yl)-7-methoxyisoquinoline,

1-((8aS)-octahydropyrrolo[1,2-a]pyrazin-2-yl)-7-methoxyisoquinoline,

7-chloro-1-((8aS)-octahydropyrrolo[1,2-a]pyrazin-2-yl)isoquinoline,

8-((8aS)-octahydropyrrolo[1,2-a]pyrazin-2-yl)-1,7-naphthyridine,

7-chloro-1-((8aR)-octahydlropyrrolo[1,2-a]pyrazin-2-yl)isoquinoline,

7-methoxy-1-octahydropyrido[1,2-a]pyrazin-2-ylisoquinoline,

7-methylsulfanyl-1-(S)-octahydropyrido[1,2-a]pyrazin-2-ylisoquinoline,

1-(S)-octahydropyrido[1,2-a]pyran-2-yl-7-hydroxyisoquinoline,

1-(S)- octahydropyrido[1,2-a]pyran-2-yl-7-sulfamoylisoquinoline,

7-dimethylamino-1-(4-methylpiperazin-1-yl)isoquinoline,

7-hydroxy-1-piperazin-1-ylisoquinoline hydrochloride,

7-(4-fluorobenzyloxy)-1-piperazin-1-ylisoquinoline,

4-((8aS)-octahydropyrrolo[1,2-a]pyrazin-2-yl)thieno[3,2-c]pyridine,

4-((8aS)-octahydropyrrolo[1,2-a]pyrazin-2-yl)furo[3,2-c]pyridine,

2-bromo-4-((8aS)-octahydropyrrolo[1,2-a]pyrazin-2-yl)thieno[3,2-c]-pyridine,

7-((8aR)-octahydropyrrolo[1,2-a]pyrazin-2-yl)thieno[2,3-c]pyridine,

4-((8aR)-octahydropyrrolo[1,2-a]pyrazin-2-yl)thieno[3,2-c]pyridine,

7-((8aR)-octahydropyrrolo[1,2-a]pyrazin-2-yl)furo[2,3-c]pyridine,

7-((7R,8aS)-7-hydlroxyoctahydropyrrolo[1,2-a]pyrazin-2-yl)furo[2,3-c]pyridine,

7-((7R,8aS)-7-hydroxyoctahydropyrrolo[1,2-a]pyrazin-2-yl)thieno[2,3-c]pyridine,

4-((8aR)-octahydropyrrolo[1,2-a]pyrazin-2-yl)furo[3,2-c]pyridine,

4-((7R,8aS)-7-hydroxyoctahydropyrrolo[1,2-a]pyrazin-2-yl)furo[3,2-c]-

pyridine,

4-((8aR)-octahydropyrrolo[1,2-a]pyrazin-2-yl)-2-methylfuro[3,2-c]pyridine,

7-((7R,8aS)-7-benzyloxyoctahydropyrrolo[1,2-a]pyrazin-2-yl)thieno-[2,3-c]pyridine,

4-((7R,8aS)-7-benzyloxyoctahydropyrrolo[1,2-a]pyrazin-2-yl)thieno-[3,2-c]pyridine,

7-octahydropyrido[1,2-a]pyrazin-2-ylfuro[2,3-c]pyridine,

4-octahydropyrido[1,2-a]pyrazin-2-ylfuro[3,2-c]pyridine,

7-octahydropyrido[1,2-a]pyrazin-2-ylthieno[2,3-c]pyridine, and

4-octahydropyrido[1,2-a]pyrazin-2-ylthieno[3,2-c]pyridine.

20. (**Currently Amended**) The method as set forth in Claim 19, in which the 5-HT_3 antagonistic agents~~-~~ which concurrently ~~having~~ exhibits 5-HT_{1A} agonistic activity ~~are~~ is a piperazinylpyridine derivatives selected from the group consisting of the following compounds, or their pharmaceutically acceptable salts:

7-chloro-1-(4-methylpiperazin-1-yl)isoquinoline,

7-((8aS)-octahydropyrrolo[1,2-a]pyrazin-2-yl)thieno[2,3-c]- pyridine,

7-((8aS)-octahydropyrrolo[1,2-a]pyrazin-2-yl)furo[2,3-c]- pyridine,

2-methyl-4-((8aS)-octahydropyrrolo[1,2-a]pyrazin-2-yl)- thieno[3,2-c]pyridine,

7-methoxy-1-((8aR)-octahydropyrrolo[1,2-a]pyrazin-2-yl)- isoquinoline, and

2-bromo-4-(4-methylpiperazin-1-yl)thieno[3,2-c]pyridine.

21. (**Currently Amended**) ~~The method as set forth in Claim 17~~A method for treating irritable bowel syndrome (IBS) by exerting 5-HT_{1A} agonistic activity and 5-HT_3 antagonistic activity in vivo simultaneously and cooperatively, which comprises

administering to a human being or other mammals who requires irritable bowel syndrome (IBS) therapy, a 5-HT_{1A} agonistic agent and a 5-HT_3 antagonistic agent simultaneously, or in sequence, or at an interval,

in which the 5-HT_{1A} agonistic agent is tandospirone, and

the 5-HT_3 antagonistic agent is a compound selected from alosetron, granisetron, azasetron, tropisetron, ramosetron, ondansetron, lerisetron, cilansetron, itasetron, indisetron, dolasetron and (R)-zacopride.

22. (**Currently Amended**) Combinations of medical preparations for treating irritable bowel syndrome, which comprise 5-HT_{1A} agonistic agent and 5-HT_3 antagonistic agent,

in which the 5-HT_{1A} agonistic agent is tandospirone, and

the 5-HT_3 antagonistic agent is a compound selected from the group consisting of alosetron, granisetron, azasetron, tropisetron, ramosetron, ondansetron, lerisetron, cilansetron, itasetron, indisetron, dolasetron and (R)-zacopride.

23. (**Previously Presented**) Serotonin receptor subtype 3 (5-HT_3) antagonistic agents concurrently having serotonin receptor subtype 1A (5-HT_{1A}) agonistic activity, said agents containing the pyrimidine derivatives or their pharmaceutically acceptable salts as set forth in claim 13.

24. (**Previously Presented**) Medical compositions containing the pyrimidine derivatives or their pharmaceutically acceptable salts as set forth in claim 13 and pharmaceutically acceptable carriers.

25. (**Previously Presented**) Treating agents for irritable bowel syndrome (IBS) containing the pyrimidine derivatives or their pharmaceutically acceptable salts as set forth in claim 13.